

Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 A2 CC: Introduction to Functions

### DO NOW

Solve, and express the answer in set builder, and interval notation:  $x^2 - 13x > 48$

-----  
 1) A relation is a set of unique \_\_\_\_\_. Here are a few examples:

$\{(1, 5) (3, 2) (8, 8) (1, 4) (7, 19.4)\}$

$\{(1, a) (2, b) (3, c) (4, d) (5, e)\}$

$\{(3.2, -90) (\text{pizza}, 435) (-2.9, \text{dishwasher}) (a, A)\}$

$\{(0, 0)\}$

2) A function is a special relation where the \_\_\_\_\_ **do not repeat**. Determine whether each of the following is a function:

$\{(A, 1) (B, 2) (C, 3) (D, 4) (E, 5)\}$

$\{(9, 0.2) (33, -77) (4, -2) (0, 0) (8, 9)\}$

$\{(1, 3) (2, 3) (9, 3) (-12, 3) (b, 3)\}$

$\{(0.2, -67) (3, h) (\text{red}, 5) (23, 9.1) (0.2, 55)\}$

3) There are **several ways** to describe/think about functions.

a] A function is a special relation whose x-values do not repeat, but the y values can repeat.

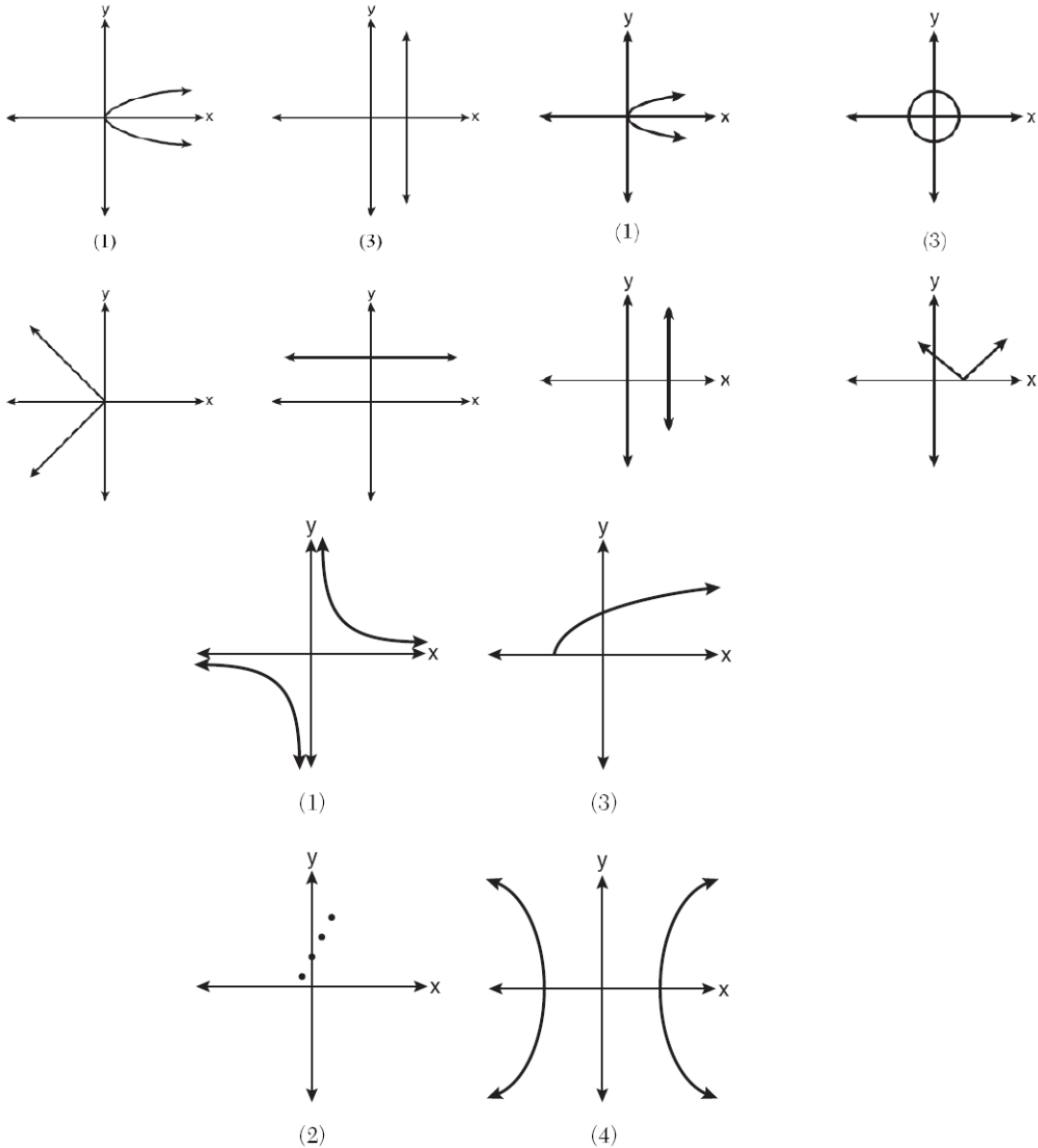
b] A function is a rule which assigns every x value **one, and only one** y value.

c] The graph of a function will pass the “vertical line test”.

What is the vertical line test?

4) The Vertical Line Test: Since the x values are not allowed to repeat, no vertical line should ever hit the graph of a function more than once.

\*5) Determine whether each of the following represents a function:



6) A function is called one-to-one if it's y values **do not repeat**.

\*That means that a **one-to-one** function has no repeating \_\_\_\_\_ or \_\_\_\_\_ values.

\*That means that a **one-to-one** function will pass both the \_\_\_\_\_ test,

and the \_\_\_\_\_ test.

7) Determine whether each of the following functions is **one-to-one**:

8) A function is called onto if it uses every  $y$  value that it is entitled to.

9) Determine whether each of the following functions is **onto**:

10) Can you summarize the main points from today?

A] A relation is a set of unique \_\_\_\_\_.

B] A function is a relation whose \_\_\_\_\_ values do not repeat.

Functions pass the \_\_\_\_\_ test.

C] A function is one-to-one if its \_\_\_\_\_ values do not repeat.

One-to-one functions also pass the \_\_\_\_\_ test.

D] A function is called onto if it uses all of the  $y$  values that it can.

11) Determine whether each of the following represents a function:

- a]  $\{(9, 2) (2, 2) (3, 5) (-6, -6) (a, h)\}$                       b]  $\{(11, 3) (3, 11) (0, 0) (b, b) (G, g)\}$
- c]  $\{(sony, playstation) (Nintendo, wii) (Nintendo DS) (Xbox, 360)\}$
- d]  $\{(-4, 2) (0.2, 5) (3/5, 5/4) (a, m) (-4, 7)\}$

12) Determine whether each of the following represents a **one-to-one** function:

- a]  $\{(4, 3) (2, 6) (8, 3) (3, h) (0, d)\}$                       b]  $\{(a, 1) (b, 2) (c, 3) (d, 4) (e, 5)\}$
- c]  $\{(0, 0) (1, 1) (2, 2) (3, 3) (4, 4)\}$                       d]  $\{(a, 5) (5, 2) (7, s) (h, k) (7, 5)\}$

13) Define each of the following:

**Function:**

**one-to-one:**

**onto:**

14) Everyone has a favorite color. Explain why this models a function.

15) If Sammi had **two** favorite colors, would the “favorite color” scenario still be a function? Explain.

16) Why is the “favorite color” scenario **not** necessarily a **one-to-one** function?

17) Why is the “favorite color” scenario **not** necessarily an **onto** function?